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Type I Progress Report for the Period 14 August to 14 October 1972 for ERTS-1 Data User Investigation of the Use of ERTS Imagery in Reservoir Management and Operation - Proposal Number MMC 89

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The second two months of our participation in the ERTS-1 program has been devoted to:

a. Overcoming problems associated with supplies, equipment, filing, staffing and housekeeping.

b. Installing Data Collection Platforms and organizing files for storing all received imagery.

c. Developing computer programs for data handling and analysis, including preliminary efforts to organize and evaluate various computer-oriented pattern recognition techniques for imagery. Contacts were made with LARS and IBM groups on this subject.

d. Initializing the assessment of the feasibility and costs for setting up a computer data-link between the Corps of Engineers, New England Division and the University of Connecticut.

e. Preliminary study of selected ERTS-1 imagery.

f. Preliminary field surveys and map reconnaissance of selected watersheds.

A listing of the locations of our operating DCP's and proposed sites for future installation is inclosed. Note changes from the list submitted with our last report.

We have had several annoying problems with both the DCS and imagery aspects of ERTS-1:

a. We are still awaiting more than half of our assigned DCP's and are approaching the season when installation in some areas will become a formidable task.

(E72-10166) THE USE OF ERTS IMAGERY IN RESERVOIR MANAGEMENT AND OPERATION Progress Report, 14 Aug. - 14 Oct. 1972 S. Cooper, et al (Corps of Engineers, Waltham, Mass.) 26 Oct. 1972 5 p CSCL 08H G3/13

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b. We estimate that tardy transfer of information from the General Electric Company regarding the necessity of unipoint grounding of DCP power supplies and sensors resulted in damage to four programmer boards.

c. The screws holding the DCP antenna element to the antenna dish were found to be undesirably short and have popped out in a number of cases.

d. The hardware for our real-time DCS data link has arrived but has not been connected. NASA's target date for establishment of our real-time data acquisition capability was 2 October.

e. Sending of DCS data and imagery to us by NASA has been often late, with occasional delays of as much as 3 to 4 weeks.

As for our present evaluation of the above situations, we have no evidence of a change in the tardiness of DCP delivery. The costs for remedial work on improperly grounded and damaged DCP's have, we believe, fallen unfairly to the users, and there have been no hints of any remedial measures for the antenna screw difficulties. We have no notification as to a firm date for inauguration of our real-time data-receiving capability, and while DCS data has been coming with a considerably lessened delay recently, we are presently as far behind as ever in receiving imagery from NASA.

Results and findings for the period covered by this report, all preliminary in nature, are as follows:

a. All MSS and RBV bulk images appear to be useful for study at this time.

b. Differences in cartographic fidelity between MSS and RBV bulk images are not important to our tasks.

c. Resolution seems generally adequate for basinwide interpretations; however detailed interpretations within small water bodies (most New England lakes, reaches and channels of rivers, many flood plains) seem to be marginal or inadequate at this time. However, we expect to improve our film analysis techniques.

d. Using MSS 6 and 7 imagery, we have identified all lakes that are mapped on USGS quads (1:62,500) and the Official State Map

(1:125, 000) in the area of Connecticut covering the Farmington, Shetucket and Quinnebaug River basins, including small unnamed lakes. In some instances we have identified new dredging ponds, inlet configurations, river sediment patterns and other surface water features not shown on maps. We can consistently identify water features about 300 feet in diameter and occasionally 150-200 feet in diameter.

e. We find that useful interpretations of drainage pattern features, drainage divides and hydrologic complexes can be made for basins as small as 25-50 square miles.

No publications have yet resulted from our study.

During the next reporting period we hope to receive enough DCS equipment and timely data and imagery to permit us to begin to carry forth our analysis of the coordinated usefulness of ERTS relayed data and imagery for Reservoir Management and Operation. This cannot happen without considerable improvement of the services provided by General Electric in the equipment realm, and NASA in that of data and imagery relay to users. A specific additional help for us would be the sending of our duplicate imagery sets directly from NASA to the University of Connecticut as Co-Investigator, instead of both sets to NED, Corps of Engineers, together with copies of all major mailings made by NASA to the ERTS Principal Investigators.

As required, a detailed Data Analysis Plan has been forwarded to NASA, under separate cover, for approval.

Cooperation amongst the three groups involved in our study now involves the New England Division, Corps of Engineers, the University of Connecticut and the Corps Cold Regions Research and Engineering Laboratory (CRREL), Hanover, New Hampshire. A number of visits were made amongst the members of these groups during the reporting period, including a major meeting of all at the University of Connecticut on 3 October.

Avenues of information exchange and possible future cooperation have been opened with other ERTS-1 investigators including the U.S. Geological Survey and NASA's Wallops Island group as well as with non-participating individuals, agencies and others interested in various

aspects of our studies. We are keeping in close contact with the Corps of Engineers Headquarters in Washington and offices outside of New England who have shown interest in this investigation. CRREL is currently undertaking a study of ERTS-1 imagery in regard to its possible applicability to the nationwide dam inventory that is currently getting underway.

A meeting of selected major DCS users is being considered for the near future to be held at NASA's Wallops Island installation, with NED, Corps of Engineers as co-host.

Changes in standing order forms, by date, are as follows:

9/8 : 70 mm. negative transparencies added to our standing order by telephone

Preparation of ERTS-1 Image Descriptor Forms is in progress. These will be forwarded to NASA as they are completed.

Data Request Forms, by date, submitted during the reported period are as follows:

9/8 : 7 color images ordered by telephone

10/13: Magnetic tapes and 70 mm. transparencies ordered by telephone for 8 images

Saul Cooper

SAUL COOPER
Principal Investigator

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As stated